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Claim Listing:

1. (original) A method for operating a disk drive in a mobile device wherein, immediately after responding to a disk access command, the disk drive is in a first operating mode that consumes a relatively high level of power and may transition to a second operating mode that consumes a relatively low level of power, the method comprising the steps of:

setting first and second time period thresholds, the first time period threshold being less than the second time period threshold;

providing an adjustable delay time interval that is set to correspond to one of the time period thresholds, the delay time interval being the time interval for waiting after an end of a response to a disk access command before transitioning from the first operating mode to the second operating mode;

measuring a demand time interval for each of a plurality of disk access commands, wherein each demand time interval is defined as a time period between an end of a response to a last disk access command and an arrival of a next disk access command;

setting the delay time interval to be equal to about the first time period threshold if a majority of a predetermined number of the plurality of demand time intervals falls within a time period less than the first time period threshold or a time period greater than the second time period threshold;

setting the delay time interval to be equal to about the second time period threshold if a majority of a predetermined number of the plurality of demand time intervals falls within a time period between the first time period threshold and the second time period threshold; and

transitioning the disk drive from the first operating mode to the second operating mode after expiration of the delay time interval.

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2. (original) A method for operating a disk drive as defined in claim 1, wherein transitioning from the second operating mode to the first operating mode consumes a transition quantity of power, and an exchange time interval is defined as a time period during which power consumed by operating in the first power operating mode is about equal to the transition quantity of power.

3. (currently amended) A method for operating a disk drive ~~as defined in claim 2~~ in a mobile device wherein, immediately after responding to a disk access command, the disk drive is in a first operating mode that consumes a relatively high level of power and may transition to a second operating mode that consumes a relatively low level of power, wherein transitioning from the second operating mode to the first operating mode consumes a transition quantity of power, and an exchange time interval is defined as a time period during which power consumed by operating in the first power operating mode is about equal to the transition quantity of power, the method comprising the steps of:

setting first and second time period thresholds, the first time period threshold being less than the second time period threshold, wherein the first time period threshold is about 0.3% of the exchange time interval, and the second time period threshold is about 66% of the exchange time interval;

providing an adjustable delay time interval that is set to correspond to one of the time period thresholds, the delay time interval being the time interval for waiting after an end of a response to a disk access command before transitioning from the first operating mode to the second operating mode;

measuring a demand time interval for each of a plurality of disk access commands, wherein each demand time interval is defined as a time period between an end of a response to a last disk access command and an arrival of a next disk access command;

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setting the delay time interval to be equal to about the first time period threshold if a majority of a predetermined number of the plurality of demand time intervals falls within a time period less than the first time period threshold or a time period greater than the second time period threshold;

setting the delay time interval to be equal to about the second time period threshold if a majority of a predetermined number of the plurality of demand time intervals falls within a time period between the first time period threshold and the second time period threshold; and

transitioning the disk drive from the first operating mode to the second operating mode after expiration of the delay time interval.

4. (original) A method for operating a disk drive as defined in claim 2, wherein the second time period threshold is less than the exchange time interval.

5. (currently amended) A method for operating a disk drive as defined in claim 1, ~~wherein the predetermined number of the plurality of demand time intervals is 7 and the majority of the predetermined number of the plurality of demand time intervals for setting the delay time interval is 4~~ in a mobile device wherein, immediately after responding to a disk access command, the disk drive is in a first operating mode that consumes a relatively high level of power and may transition to a second operating mode that consumes a relatively low level of power, the method comprising the steps of:

setting first and second time period thresholds, the first time period threshold being less than the second time period threshold;

providing an adjustable delay time interval that is set to correspond to one of the time period thresholds, the delay time interval being the time interval for waiting after an end of a response to a disk access command before transitioning from the first operating mode to the second operating mode;

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measuring a demand time interval for each of a plurality of disk access commands,
wherein each demand time interval is defined as a time period between an end of a response to a
last disk access command and an arrival of a next disk access command;

setting the delay time interval to be equal to about the first time period threshold if 4 of 7
of the plurality of demand time intervals falls within a time period less than the first time period
threshold or a time period greater than the second time period threshold;

setting the delay time interval to be equal to about the second time period threshold if 4 of
7 of the plurality of demand time intervals falls within a time period between the first time period
threshold and the second time period threshold; and

transitioning the disk drive from the first operating mode to the second operating mode
after expiration of the delay time interval.

6. (original) A method for operating a disk drive as defined in claim 1, wherein the demand time intervals comprising the predetermined number of the plurality of demand time intervals are measured using the most recent disk access commands.

7. (original) A method for operating a disk drive in a mobile device wherein, immediately after responding to a disk access command, the disk drive is in first operating mode that consumes a relatively high level of power and may transition to a second operating mode that consumes a relatively low level of power, the method comprising the steps of:

setting first, second and third time period thresholds, the first time period threshold being less than the second time period threshold and the second time period threshold being less than the third time period threshold;

providing an adjustable delay time interval that is set to correspond to one of the time period thresholds, the delay time interval being the time interval for waiting after an end of a

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response to a disk access command before transitioning from the first operating mode to the second operating mode;

measuring a demand time interval for each of a plurality of disk access commands, wherein each demand time interval is defined as a time period between an end of a response to a last disk access command and an arrival of a next disk access command;

setting the delay time interval to be equal to about the first time period threshold if a majority of a predetermined number of the plurality of demand time intervals falls within a time period less than the first time period threshold or a time period greater than the third time period threshold;

setting the delay time interval to be equal to about the second time period threshold if a majority of a predetermined number of the plurality of demand time intervals falls within a time period between the first time period threshold and the second time period threshold;

setting the delay time interval to be equal to about the third time period threshold if a majority of a predetermined number of the plurality of demand time intervals falls within a time period between the second time period threshold and the third time period threshold; and

transitioning the disk drive from the first operating mode to the second operating mode after expiration of the delay time interval.

8. (original) A method for operating a disk drive as defined in claim 7, wherein transitioning from the second operating mode to the first operating mode consumes a transition quantity of power, and an exchange time interval is defined as a time period during which power consumed by operating in the first power operating mode is about equal to the transition quantity of power.

9. (currently amended) A method for operating a disk drive ~~as defined in claim 8~~ in a mobile device wherein, immediately after responding to a disk access command, the disk drive is

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in first operating mode that consumes a relatively high level of power and may transition to a second operating mode that consumes a relatively low level of power, wherein transitioning from the second operating mode to the first operating mode consumes a transition quantity of power, and an exchange time interval is defined as a time period during which power consumed by operating in the first power operating mode is about equal to the transition quantity of power, the method comprising the steps of:

setting first, second and third time period thresholds, the first time period threshold being less than the second time period threshold and the second time period threshold being less than the third time period threshold, wherein the first time period threshold is about 0.3% of the exchange time interval, the second time period threshold is about 33% of the exchange time period, and the third time period threshold is about 66% of the exchange time interval;

providing an adjustable delay time interval that is set to correspond to one of the time period thresholds, the delay time interval being the time interval for waiting after an end of a response to a disk access command before transitioning from the first operating mode to the second operating mode;

measuring a demand time interval for each of a plurality of disk access commands, wherein each demand time interval is defined as a time period between an end of a response to a last disk access command and an arrival of a next disk access command;

setting the delay time interval to be equal to about the first time period threshold if a majority of a predetermined number of the plurality of demand time intervals falls within a time period less than the first time period threshold or a time period greater than the third time period threshold;

setting the delay time interval to be equal to about the second time period threshold if a majority of a predetermined number of the plurality of demand time intervals falls within a time period between the first time period threshold and the second time period threshold;

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setting the delay time interval to be equal to about the third time period threshold if a majority of a predetermined number of the plurality of demand time intervals falls within a time period between the second time period threshold and the third time period threshold; and
transitioning the disk drive from the first operating mode to the second operating mode after expiration of the delay time interval..

10. (original) A method for operating a disk drive as defined in claim 8, wherein the third time period threshold is less than the exchange time interval.

11. (currently amended) A method for operating a disk drive ~~as defined in claim 7,~~
~~wherein the predetermined number of the plurality demand time intervals is 7 and the majority of the predetermined number of the plurality demand time intervals for setting the delay time interval is 4~~ in a mobile device wherein, immediately after responding to a disk access command, the disk drive is in first operating mode that consumes a relatively high level of power and may transition to a second operating mode that consumes a relatively low level of power, the method comprising the steps of:

setting first, second and third time period thresholds, the first time period threshold being less than the second time period threshold and the second time period threshold being less than the third time period threshold;

providing an adjustable delay time interval that is set to correspond to one of the time period thresholds, the delay time interval being the time interval for waiting after an end of a response to a disk access command before transitioning from the first operating mode to the second operating mode;

measuring a demand time interval for each of a plurality of disk access commands, wherein each demand time interval is defined as a time period between an end of a response to a last disk access command and an arrival of a next disk access command;

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setting the delay time interval to be equal to about the first time period threshold if 4 of 7 of the plurality of demand time intervals falls within a time period less than the first time period threshold or a time period greater than the third time period threshold;

setting the delay time interval to be equal to about the second time period threshold if 4 of 7 of the plurality of demand time intervals falls within a time period between the first time period threshold and the second time period threshold;

setting the delay time interval to be equal to about the third time period threshold if 4 of 7 of the plurality of demand time intervals falls within a time period between the second time period threshold and the third time period threshold; and

transitioning the disk drive from the first operating mode to the second operating mode after expiration of the delay time interval.

12. (original) A method for operating a disk drive as defined in claim 7, wherein the demand time intervals comprising the predetermined number of the plurality of demand time intervals are measured using the most recent disk access commands.

13. (original) A mobile device having a disk drive wherein, immediately after responding to a disk access command from the mobile device, the disk drive is in a first operating mode that consumes a relatively high level of power and may transition to a second operating mode that consumes a relatively low level of power, the disk drive comprising:

means for setting first and second time period thresholds, the first time period threshold being less than the second time period threshold;

means for providing an adjustable delay time interval that is set to correspond to one of the time period thresholds, the delay time interval being the time interval for waiting after an end of a response to a disk access command before transitioning from the first operating mode to the second operating mode;

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means for measuring a demand time interval for each of a plurality of disk access commands, wherein each demand time interval is defined as a time period between an end of a response to a last disk access command and an arrival of a next disk access command;

means for setting the delay time interval to be equal to about the first time period threshold if a majority of a predetermined number of the plurality of demand time intervals falls within a time period less than the first time period threshold or a time period greater than the second time period threshold, and setting the delay time interval to be equal to about the second time period threshold if a majority of a predetermined number of the plurality of demand time intervals falls within a time period between the first time period threshold and the second time period threshold; and

means for transitioning the disk drive from the first operating mode to the second operating mode after expiration of the delay time interval.

14. (original) A mobile device having a disk drive as defined in claim 13, wherein transitioning from the second operating mode to the first operating mode consumes a transition quantity of power, and an exchange time interval is defined as a time period during which power consumed by operating in the first power operating mode is about equal to the transition quantity of power.

15. (currently amended) A mobile device having a disk drive ~~as defined in claim 14~~ wherein, immediately after responding to a disk access command from the mobile device, the disk drive is in a first operating mode that consumes a relatively high level of power and may transition to a second operating mode that consumes a relatively low level of power, and wherein transitioning from the second operating mode to the first operating mode consumes a transition quantity of power, and an exchange time interval is defined as a time period during which power

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consumed by operating in the first power operating mode is about equal to the transition quantity of power, the disk drive comprising:

means for setting first and second time period thresholds, the first time period threshold being less than the second time period threshold, wherein the first time period threshold is about 0.3% of the exchange time interval, and the second time period threshold is about 66% of the exchange time interval;

means for providing an adjustable delay time interval that is set to correspond to one of the time period thresholds, the delay time interval being the time interval for waiting after an end of a response to a disk access command before transitioning from the first operating mode to the second operating mode;

means for measuring a demand time interval for each of a plurality of disk access commands, wherein each demand time interval is defined as a time period between an end of a response to a last disk access command and an arrival of a next disk access command;

means for setting the delay time interval to be equal to about the first time period threshold if a majority of a predetermined number of the plurality of demand time intervals falls within a time period less than the first time period threshold or a time period greater than the second time period threshold, and setting the delay time interval to be equal to about the second time period threshold if a majority of a predetermined number of the plurality of demand time intervals falls within a time period between the first time period threshold and the second time period threshold; and

means for transitioning the disk drive from the first operating mode to the second operating mode after expiration of the delay time interval.

16. (original) A mobile device having a disk drive as defined in claim 14, wherein the second time period threshold is less than the exchange time interval.

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17. (currently amended) A mobile device having a disk drive ~~as defined in claim 13,~~
~~wherein the predetermined number of the plurality of demand time intervals is 7 and the majority~~
~~of the predetermined number of the plurality of demand time intervals for setting the delay time~~
~~interval is 4~~ wherein, immediately after responding to a disk access command from the mobile
device, the disk drive is in a first operating mode that consumes a relatively high level of power
and may transition to a second operating mode that consumes a relatively low level of power, the
disk drive comprising:

means for setting first and second time period thresholds, the first time period threshold
being less than the second time period threshold;

means for providing an adjustable delay time interval that is set to correspond to one of
the time period thresholds, the delay time interval being the time interval for waiting after an end
of a response to a disk access command before transitioning from the first operating mode to the
second operating mode;

means for measuring a demand time interval for each of a plurality of disk access
commands, wherein each demand time interval is defined as a time period between an end of a
response to a last disk access command and an arrival of a next disk access command;

means for setting the delay time interval to be equal to about the first time period
threshold if 4 of 7 of the plurality of demand time intervals falls within a time period less than
the first time period threshold or a time period greater than the second time period threshold, and
setting the delay time interval to be equal to about the second time period threshold if 4 of 7 of
the plurality of demand time intervals falls within a time period between the first time period
threshold and the second time period threshold; and

means for transitioning the disk drive from the first operating mode to the second
operating mode after expiration of the delay time interval.

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18. (original) A mobile device having a disk drive as defined in claim 13, wherein the demand time intervals comprising the predetermined number of the plurality of demand time intervals used by the means for setting the delay time interval are measured using the most recent disk access commands.

19. (original) A mobile device having a disk drive wherein, immediately after responding to a disk access command, the disk drive is in first operating mode that consumes a relatively high level of power and may transition to a second operating mode that consumes a relatively low level of power, the disk drive comprising:

means for setting first, second and third time period thresholds, the first time period threshold being less than the second time period threshold and the second time period threshold being less than the third time period threshold;

means for providing an adjustable delay time interval that is set to correspond to one of the time period thresholds, the delay time interval being the time interval for waiting after an end of a response to a disk access command before transitioning from the first operating mode to the second operating mode;

means for measuring a demand time interval for each of a plurality of disk access commands, wherein each demand time interval is defined as a time period between an end of a response to a last disk access command and an arrival of a next disk access command;

means for setting the delay time interval to be equal to about the first time period threshold if a majority of a predetermined number of the plurality of demand time intervals falls within a time period less than the first time period threshold or a time period greater than the third time period threshold, setting the delay time interval to be equal to about the second time period threshold if a majority of a predetermined number of the plurality of demand time intervals falls within a time period between the first time period threshold and the second time period threshold, and setting the delay time interval to be equal to about the third time period

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threshold if a majority of a predetermined number of the plurality of demand time intervals falls within a time period between the second time period threshold and the third time period threshold; and

means for transitioning the disk drive from the first operating mode to the second operating mode after expiration of the delay time interval.

20. (original) A mobile device having a disk drive as defined in claim 19, wherein transitioning from the second operating mode to the first operating mode consumes a transition quantity of power, and an exchange time interval is defined as a time period during which power consumed by operating in the first power operating mode is about equal to the transition quantity of power.

21. (currently amended) A mobile device having a disk drive ~~as defined in claim 20~~ wherein, immediately after responding to a disk access command, the disk drive is in first operating mode that consumes a relatively high level of power and may transition to a second operating mode that consumes a relatively low level of power, and wherein transitioning from the second operating mode to the first operating mode consumes a transition quantity of power, and an exchange time interval is defined as a time period during which power consumed by operating in the first power operating mode is about equal to the transition quantity of power, the disk drive comprising:

means for setting first, second and third time period thresholds, the first time period threshold being less than the second time period threshold and the second time period threshold being less than the third time period threshold, wherein the first time period threshold is about 0.3% of the exchange time interval, the second time period threshold is about 33% of the exchange time period, and the third time period threshold is about 66% of the exchange time interval;

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means for providing an adjustable delay time interval that is set to correspond to one of the time period thresholds, the delay time interval being the time interval for waiting after an end of a response to a disk access command before transitioning from the first operating mode to the second operating mode;

means for measuring a demand time interval for each of a plurality of disk access commands, wherein each demand time interval is defined as a time period between an end of a response to a last disk access command and an arrival of a next disk access command;

means for setting the delay time interval to be equal to about the first time period threshold if a majority of a predetermined number of the plurality of demand time intervals falls within a time period less than the first time period threshold or a time period greater than the third time period threshold, setting the delay time interval to be equal to about the second time period threshold if a majority of a predetermined number of the plurality of demand time intervals falls within a time period between the first time period threshold and the second time period threshold, and setting the delay time interval to be equal to about the third time period threshold if a majority of a predetermined number of the plurality of demand time intervals falls within a time period between the second time period threshold and the third time period threshold; and

means for transitioning the disk drive from the first operating mode to the second operating mode after expiration of the delay time interval.

22. (original) A mobile device having a disk drive as defined in claim 20, wherein the third time period threshold is less than the exchange time interval.

23. (currently amended) A mobile device having a disk drive as defined in claim 19, ~~wherein the predetermined number of the plurality of demand time intervals is 7 and the majority of the predetermined number of the plurality of demand time intervals for setting the delay time~~

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interval is 4 wherein, immediately after responding to a disk access command, the disk drive is in first operating mode that consumes a relatively high level of power and may transition to a second operating mode that consumes a relatively low level of power, the disk drive comprising:

means for setting first, second and third time period thresholds, the first time period threshold being less than the second time period threshold and the second time period threshold being less than the third time period threshold;

means for providing an adjustable delay time interval that is set to correspond to one of the time period thresholds, the delay time interval being the time interval for waiting after an end of a response to a disk access command before transitioning from the first operating mode to the second operating mode;

means for measuring a demand time interval for each of a plurality of disk access commands, wherein each demand time interval is defined as a time period between an end of a response to a last disk access command and an arrival of a next disk access command;

means for setting the delay time interval to be equal to about the first time period threshold if 4 of 7 of the plurality of demand time intervals falls within a time period less than the first time period threshold or a time period greater than the third time period threshold, setting the delay time interval to be equal to about the second time period threshold if 4 of 7 of the plurality of demand time intervals falls within a time period between the first time period threshold and the second time period threshold, and setting the delay time interval to be equal to about the third time period threshold if 4 of 7 of the plurality of demand time intervals falls within a time period between the second time period threshold and the third time period threshold; and

means for transitioning the disk drive from the first operating mode to the second operating mode after expiration of the delay time interval.

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24. (original) A mobile device having a disk drive as defined in claim 19, wherein the demand time intervals comprising the predetermined number of the plurality of demand time intervals used by the means for setting the delay time interval are measured using the most recent disk access commands.

25. (original) A disk drive for use in a mobile device wherein, immediately after responding to a disk access command from the mobile device, the disk drive is in a first operating mode that consumes a relatively high level of power and may transition to a second operating mode that consumes a relatively low level of power, the disk drive comprising:

means for setting first and second time period thresholds, the first time period threshold being less than the second time period threshold;

means for providing an adjustable delay time interval that is set to correspond to one of the time period thresholds, the delay time interval being the time interval for waiting after an end of a response to a disk access command before transitioning from the first operating mode to the second operating mode;

means for measuring a demand time interval for each of a plurality of disk access commands, wherein each demand time interval is defined as a time period between an end of a response to a last disk access command and an arrival of a next disk access command;

means for setting the delay time interval to be equal to about the first time period threshold if a majority of a predetermined number of the plurality of demand time intervals falls within a time period less than the first time period threshold or a time period greater than the second time period threshold, and setting the delay time interval to be equal to about the second time period threshold if a majority of a predetermined number of the plurality of demand time intervals falls within a time period between the first time period threshold and the second time period threshold; and

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means for transitioning the disk drive from the first operating mode to the second operating mode after expiration of the delay time interval.

26. (original) A disk drive as defined in claim 25, wherein transitioning from the second operating mode to the first operating mode consumes a transition quantity of power, and an exchange time interval is defined as a time period during which power consumed by operating in the first power operating mode is about equal to the transition quantity of power.

27. (currently amended) A disk drive as defined in claim 26 wherein, immediately after responding to a disk access command from the mobile device, the disk drive is in a first operating mode that consumes a relatively high level of power and may transition to a second operating mode that consumes a relatively low level of power, wherein transitioning from the second operating mode to the first operating mode consumes a transition quantity of power, and an exchange time interval is defined as a time period during which power consumed by operating in the first power operating mode is about equal to the transition quantity of power, the disk drive comprising:

means for setting first and second time period thresholds, the first time period threshold being less than the second time period threshold, wherein the first time period threshold is about 0.3% of the exchange time interval, and the second time period threshold is about 66% of the exchange time interval;

means for providing an adjustable delay time interval that is set to correspond to one of the time period thresholds, the delay time interval being the time interval for waiting after an end of a response to a disk access command before transitioning from the first operating mode to the second operating mode;

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means for measuring a demand time interval for each of a plurality of disk access commands, wherein each demand time interval is defined as a time period between an end of a response to a last disk access command and an arrival of a next disk access command;

means for setting the delay time interval to be equal to about the first time period threshold if a majority of a predetermined number of the plurality of demand time intervals falls within a time period less than the first time period threshold or a time period greater than the second time period threshold, and setting the delay time interval to be equal to about the second time period threshold if a majority of a predetermined number of the plurality of demand time intervals falls within a time period between the first time period threshold and the second time period threshold; and

means for transitioning the disk drive from the first operating mode to the second operating mode after expiration of the delay time interval.

28. (original) A disk drive as defined in claim 26, wherein the second time period threshold is less than the exchange time interval.

29. (currently amended) ~~A disk drive as defined in claim 25, wherein the predetermined number of the plurality of demand time intervals is 7 and the majority of the predetermined number of the plurality of demand time intervals for setting the delay time interval is 4 wherein,~~
immediately after responding to a disk access command from the mobile device, the disk drive is in a first operating mode that consumes a relatively high level of power and may transition to a second operating mode that consumes a relatively low level of power, the disk drive comprising:

means for setting first and second time period thresholds, the first time period threshold being less than the second time period threshold;

means for providing an adjustable delay time interval that is set to correspond to one of the time period thresholds, the delay time interval being the time interval for waiting after an end

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of a response to a disk access command before transitioning from the first operating mode to the second operating mode;

means for measuring a demand time interval for each of a plurality of disk access commands, wherein each demand time interval is defined as a time period between an end of a response to a last disk access command and an arrival of a next disk access command;

means for setting the delay time interval to be equal to about the first time period threshold if a majority of a predetermined number of the plurality of demand time intervals falls within a time period less than the first time period threshold or a time period greater than the second time period threshold, and setting the delay time interval to be equal to about the second time period threshold if a majority of a predetermined number of the plurality of demand time intervals falls within a time period between the first time period threshold and the second time period threshold; and

means for transitioning the disk drive from the first operating mode to the second operating mode after expiration of the delay time interval.

30. (original) A disk drive as defined in claim 25, wherein the demand time intervals comprising the predetermined number of the plurality of demand time intervals used by the means for setting the delay time interval are measured using the most recent disk access commands.

31. (original) A disk drive for use in a mobile device wherein, immediately after responding to a disk access command, the disk drive is in first operating mode that consumes a relatively high level of power and may transition to a second operating mode that consumes a relatively low level of power, the disk drive comprising:

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means for setting first, second and third time period thresholds, the first time period threshold being less than the second time period threshold and the second time period threshold being less than the third time period threshold;

means for providing an adjustable delay time interval that is set to correspond to one of the time period thresholds, the delay time interval being the time interval for waiting after an end of a response to a disk access command before transitioning from the first operating mode to the second operating mode;

means for measuring a demand time interval for each of a plurality of disk access commands, wherein each demand time interval is defined as a time period between an end of a response to a last disk access command and an arrival of a next disk access command;

means for setting the delay time interval to be equal to about the first time period threshold if a majority of a predetermined number of the plurality of demand time intervals falls within a time period less than the first time period threshold or a time period greater than the third time period threshold, setting the delay time interval to be equal to about the second time period threshold if a majority of a predetermined number of the plurality of demand time intervals falls within a time period between the first time period threshold and the second time period threshold, and setting the delay time interval to be equal to about the third time period threshold if a majority of a predetermined number of the plurality of demand time intervals falls within a time period between the second time period threshold and the third time period threshold; and

means for transitioning the disk drive from the first operating mode to the second operating mode after expiration of the delay time interval.

32. (original) A disk drive as defined in claim 31, wherein transitioning from the second operating mode to the first operating mode consumes a transition quantity of power, and an

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exchange time interval is defined as a time period during which power consumed by operating in the first power operating mode is about equal to the transition quantity of power.

33. (currently amended) A disk drive as defined in claim 32 wherein, immediately after responding to a disk access command, the disk drive is in first operating mode that consumes a relatively high level of power and may transition to a second operating mode that consumes a relatively low level of power, and wherein transitioning from the second operating mode to the first operating mode consumes a transition quantity of power, and an exchange time interval is defined as a time period during which power consumed by operating in the first power operating mode is about equal to the transition quantity of power, the disk drive comprising:

means for setting first, second and third time period thresholds, the first time period threshold being less than the second time period threshold and the second time period threshold being less than the third time period threshold, wherein the first time period threshold is about 0.3% of the exchange time interval, the second time period threshold is about 33% of the exchange time period, and the third time period threshold is about 66% of the exchange time interval;

means for providing an adjustable delay time interval that is set to correspond to one of the time period thresholds, the delay time interval being the time interval for waiting after an end of a response to a disk access command before transitioning from the first operating mode to the second operating mode;

means for measuring a demand time interval for each of a plurality of disk access commands, wherein each demand time interval is defined as a time period between an end of a response to a last disk access command and an arrival of a next disk access command;

means for setting the delay time interval to be equal to about the first time period threshold if a majority of a predetermined number of the plurality of demand time intervals falls within a time period less than the first time period threshold or a time period greater than the

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third time period threshold, setting the delay time interval to be equal to about the second time period threshold if a majority of a predetermined number of the plurality of demand time intervals falls within a time period between the first time period threshold and the second time period threshold, and setting the delay time interval to be equal to about the third time period threshold if a majority of a predetermined number of the plurality of demand time intervals falls within a time period between the second time period threshold and the third time period threshold; and

means for transitioning the disk drive from the first operating mode to the second operating mode after expiration of the delay time interval.

34. (original) A disk drive as defined in claim 32, wherein the third time period threshold is less than the exchange time interval.

35. (currently amended) A disk drive ~~as defined in claim 31, wherein the predetermined number of the plurality of demand time intervals is 7 and the majority of the predetermined number of the plurality of demand time intervals for setting the delay time interval is 4~~ wherein, immediately after responding to a disk access command, the disk drive is in first operating mode that consumes a relatively high level of power and may transition to a second operating mode that consumes a relatively low level of power, the disk drive comprising:

means for setting first, second and third time period thresholds, the first time period threshold being less than the second time period threshold and the second time period threshold being less than the third time period threshold;

means for providing an adjustable delay time interval that is set to correspond to one of the time period thresholds, the delay time interval being the time interval for waiting after an end of a response to a disk access command before transitioning from the first operating mode to the second operating mode;

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means for measuring a demand time interval for each of a plurality of disk access commands, wherein each demand time interval is defined as a time period between an end of a response to a last disk access command and an arrival of a next disk access command;

means for setting the delay time interval to be equal to about the first time period threshold if 4 of 7 of the plurality of demand time intervals falls within a time period less than the first time period threshold or a time period greater than the third time period threshold; setting the delay time interval to be equal to about the second time period threshold if 4 of 7 of the plurality of demand time intervals falls within a time period between the first time period threshold and the second time period threshold, and setting the delay time interval to be equal to about the third time period threshold if 4 of 7 of the plurality of demand time intervals falls within a time period between the second time period threshold and the third time period threshold; and

means for transitioning the disk drive from the first operating mode to the second operating mode after expiration of the delay time interval.

36. (original) A disk drive as defined in claim 31, wherein the demand time intervals comprising the predetermined number of the plurality of demand time intervals used by the means for setting the delay time interval are measured using the most recent disk access commands.

37. (new) A method for operating a disk drive as defined in claim 1, wherein the majority for setting the demand time interval to be equal to about the first time period threshold includes at least one demand time interval that falls within the time period greater than the second time period threshold.

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38. (new) A method for operating a disk drive as defined in claim 7, wherein the majority for setting the demand time interval to be equal to about the first time period threshold includes at least one demand time interval that falls within the time period greater than the third time period threshold.

39. (new) A mobile device having a disk drive as defined in claim 13, wherein the majority for setting the demand time interval to be equal to about the first time period threshold includes at least one demand time interval that falls within the time period greater than the second time period threshold.

40. (new) A mobile device having a disk drive as defined in claim 19, wherein the majority for setting the demand time interval to be equal to about the first time period threshold includes at least one demand time interval that falls within the time period greater than the third time period threshold.

41. (new) A disk drive as defined in claim 25, wherein the majority for setting the demand time interval to be equal to about the first time period threshold includes at least one demand time interval that falls within the time period greater than the second time period threshold.

42. (new) A disk drive as defined in claim 31, wherein the majority for setting the demand time interval to be equal to about the first time period threshold includes at least one demand time interval that falls within the time period greater than the third time period threshold.